

### **ABSTRACT**

A phase locked loop frequency synthesizer in which frequency gain of a voltage controlled oscillator is compensated is disclosed. The phase locked loop frequency synthesizer measures a frequency gain variation of the voltage controlled oscillator and compensates the variation by controlling phase gain of a phase comparator or voltage gain of a loop filter. Gain characteristics of the voltage controlled oscillator are detected and fed back to control frequency gain of the voltage controlled oscillator, so as to allow the voltage controlled oscillator to have uniform frequency gain. Accordingly, the phase locked loop frequency synthesizer can obtain uniform loop gain irrespective of a frequency gain variation of the voltage controlled oscillator and provide optimum phase noise characteristics and stability.